

WHAT IS CLAIMED IS:

1. A phase comparator for detecting a phase difference between a first signal and a second signal serving as a reference, comprising:
 - a retiming circuit sampling said first signal at a timing synchronized with said second signal to output a third signal; and
 - 5 a phase comparison unit for passing a current according to the phase difference based on said first, second and third signals, said phase comparison unit including
 - a first current source and a second current source,
 - an output node,
 - 10 a first current control circuit connected between said first current source and said output node and passing a current flown to said output node when a result of an exclusive OR operation between said first signal and said third signal is a first logic level, and
 - a second current control circuit connected between said second
 - 15 current source and said output node and receiving a current flown from said output node when said second signal has a second logic level opposite to said first logic level,
 - said first current control circuit having two switching units connected between said first current source and said output node, and
 - 20 said two switching units being designed to provide said first logic level as the result of the exclusive OR operation between said first signal and said third signal when at least one of said two switching units is turned on according to a predetermined combination of said first signal and said third signal that are input.
2. The phase comparator according to claim 1, wherein said phase comparison unit further includes
 - a first logic circuit provided correspondingly to one of said two
 - switching units and receiving respective inputs of said first signal and said
 - 5 third signal to output a result of a logical OR operation between said first signal and said third signal, and

10 a second logic circuit provided correspondingly to the other of said two switching units and receiving respective inputs of said first signal and said third signal to output a result of a logical OR operation between an inverted signal of said first signal and an inverted signal of said third signal.

3. The phase comparator according to claim 1, wherein said phase comparison unit further includes
5 a first logic circuit provided correspondingly to one of said two switching units and receiving respective inputs of said first signal and said third signal to output a result of a logical AND operation between an inverted signal of said first signal and said third signal, and
10 a second logic circuit provided correspondingly to the other of said two switching units and receiving respective inputs of said first signal and said third signal to output a result of a logical AND operation between said first signal and an inverted signal of said third signal.

4. The phase comparator according to claim 1, wherein said two switching units are connected in parallel between said first current source and said output node,
5 one of said two switching units has first and second switching elements connected in series,
said first and second switching elements are turned on when both of respective inputs of said first signal and said third signal have said first logic level,
10 the other of said two switching units has third and fourth switching elements connected in series, and
said third and fourth switching elements are turned on when both of respective inputs of an inverted signal of said first signal and an inverted signal of said third signal have said first logic level.

5. The phase comparator according to claim 1, wherein said two switching units are connected in series between said first current source and said output node,

5 one of said two switching units has first and second switching elements connected in parallel,

at least one of said first and second switching elements is turned on when at least one of respective inputs of said first signal and an inverted signal of said third signal has said first logic level,

10 the other of said two switching units has third and fourth switching elements connected in parallel, and

at least one of said third and fourth switching elements is turned on when at least one of respective inputs of an inverted signal of said first signal and said third signal has said first logic level.

6. The phase comparator according to claim 1, wherein said phase comparison unit further includes an internal node connecting said second current source and said second current control circuit, and
5 a current supply unit supplying a current from said output node to said internal node when said second signal has said first logic level.

7. The phase comparator according to claim 1, wherein said phase comparison unit passes a current flown to said output node, according to a relative comparison between a first period serving as a reference and a second period, said first period is a period in which said
5 second signal has said second logic level and said second period is a period in which the result of the exclusive OR operation between said first signal and said third signal in said first current control circuit is said first logic level,
when said second period is longer than said first period, the current is flown out from said output node according to said relative comparison,
10 when said first period is longer than said second period, the current is flown in from said output node according to said relative comparison and, when said first period is equal to said second period, a predetermined current is passed from said first current control circuit to said second current control circuit via said output node.